# Sustainable Sites Prerequisite: Comparison of Seattle and Referenced Standard

LEED Rating System™ V. 2.1 Sustainable Sites Prerequisite 1, Erosion and Sedimentation Control, requires projects to "Design to a site sediment and erosion control plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-832-R-92-005, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent." One of the submittals required if following local codes rather than EPA BMPs is a description of how local standards meet or exceed the referenced EPA standards. This document is a comparison of the LEED™-referenced standard BMPs with Seattle Department of Design, Construction and Land Use Director's Rule 16-2000: "Construction Stormwater Control Technical Requirements Manual." The 126-page Technical Requirements Manual is online at www.seattle.gov/dclu/Codes/dr/DR2000-16.pdf.

**How to use this document:** This document is a synopsis of Seattle construction stormwater code, vis a vis EPA stormwater BMPs. It is not intended as a substitute for actual code requirements. The comparison language in the table below should facilitate comparisons for purposes of documenting a Seattle LEED project's compliance with the Sustainable Sites Prerequisite. Find the BMPs employed in the erosion and sedimentation control plan for your project in the list below, review the comparison language, and incorporate the comparison language into your projects documentation for meeting the requirements of the prerequisite.

It should be noted that the EPA BMPs were created for projects with over 10 acres of disturbed area, a situation that is rare in Seattle's developed landscape. Consequently, some of the BMPs are not particularly applicable to smaller, already-developed sites, which describes the majority of development within the City of Seattle.

In Seattle, erosion and sedimentation control requirements apply to *all* projects involving land disturbing activities, and review is required of projects involving 750ft$^2$ or more of land disturbance, with additional requirements for large projects, defined as land disturbing activities of 5000ft$^2$ or more.

Seattle code requires that both large and small land disturbing activities employ an erosion and sedimentation control regime to "(p)revent the transport of sediment from the site" – that is, stormwater leaving the site is to be free from sediment and other pollutants. A menu of practices is then offered, and the most applicable practice(s) selected. A measure-by-measure comparison of EPA BMPs and Seattle control measures does not fully capture the intent of the Seattle Code. For this reason, the comparison is preceded by a synopsis of the Seattle code requirements.

General requirements from the Seattle code that are more stringent than EPA BMPs:

- **Timeframe for action**: Seattle code requires any disturbed area to be stabilized within 2 days between October 1 and May 31 and within 7 days between June 1 and September 31.
- **Development of a maintenance manual**: Maintenance and repair of all BMPs shall be conducted in accordance with an approved manual.

**Removal of temporary measures**: All temporary erosion and sediment measures should be removed within 30 days after final site stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment must be removed or stabilized. Disturbed soil areas resulting from removal should be permanently stabilized.

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| **Symbol Guide** | ▲ | = Seattle code more stringent and/or specific. |
| | ▼ | = Seattle code less stringent and/or specific. |
| | ▲▼ | = Seattle code equivalent in stringency and/or specificity. |
| | ? | = No directly equivalent BMP in Seattle code. Using these EPA BMPs will require case-by-case approval by Seattle code authorities. |

For the purposes of this document, **stringency** is evaluated in terms of enhanced environmental protection by requiring actions that exceed those outlined in the EPA BMPs. **Specificity** refers to additional (or more detailed) actions that although may not constitute enhanced stringency, provide a greater level of assurance that the proposed actions are carried out as intended.

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| EPA referenced standards | | Equivalent element(s) in Seattle Stormwater Code and Analysis of Stringency |
|---|---|---|
| **Stabilization Practices** | | |
| **Temporary Seeding** | ▲ | **BMP E 1.10: Temporary Seeding of Stripped Areas**<br>Seattle code features design criteria with more specificity and stringency than EPA BMP (e.g., requiring mulching depending on season, soil preparation, restrictions on phosphate fertilizers near water bodies). |
| **Mulching** | ▲ | **BMP E1.15: Mulching and Matting**<br>Seattle code offers additional criteria and restrictions for the use of mulching and matting. Also additional criteria for maintenance. |
| **Geotextiles** | ▲ | **Not generally recommended under Seattle's Stormwater Code** (DR 16-00).<br>Geotextiles, as defined by the City of Seattle, tend to increase stormwater velocity, adversely impacting water quality and erosion. Not recommending this strategy as a BMP represents increase in the stringency.<br>However, EPA seems to define geotextiles differently than Seattle code. On page 3-17 of the EPA document, geotextiles are described as "porous fabrics… made from synthetic materials… (or) biodegradable materials such as mulch matting and netting." Biodegradable mulch matting materials are covered in Seattle's BMP 1.15, Mulching and Matting. Seattle BMP 1.15 can be seen as environmentally preferable to EPA's BMP for geotextiles, since it stresses the importance of using biodegradable, plant-based products. Synthetic products have been known to harm wildlife and inhibit revegetation. |
| **Chemical Stabilization** | ▲ | **Not recommended under Seattle's Stormwater Code** (DR 16-00)**.**<br>Seattle code can be considered more stringent, as it doesn't allow this practice, referencing a study showing that chemical stabilization can actually increase the amount of suspended solids in runoff. |
| **Permanent Seeding and Planting** | ▲ | **BMP E1.35: Permanent Seeding and Planting**<br>Design, maintenance, and timing criteria are all more specific and stringent in Seattle code. Restrictions as to season of for employing this BMP in Seattle. Seattle code lists restrictions on use of invasive species. |
| **Buffer Zones** | ▲ | **BMP E1.30: Buffer Zones** and **Seattle Municipal Code "Environmentally Critical Areas" Ordinance**<br>Local "Environmental Critical Areas" regulations *require* buffer zones in certain designated areas, making Seattle code equivalent/more stringent to EPA BMP. Seattle limits disturbed area to outside dripline and states: "Leave all unstable steep slopes in natural vegetation." Seattle limits debris and soil stockpiling to areas outside the buffer zone. |
| **Preservation of Natural Vegetation** | ▲ | **BMP E1.25: Preserving Natural Vegetation**.<br>Seattle's code more specific as to plant selection and protection. |
| **Sod Stabilization** | ▲ | **BMP E1.40 Sodding**<br>Seattle more comprehensive by requiring soil preparation and additional installation requirements (e.g., use of topsoil in accordance with **BMP E1.45: Topsoiling**, details for soil pH, fertilizing re: amounts, and depth, sod strip layout, and stapling). |
| **Stream Bank Stabilization** | ▲ | Seattle Code environmentally preferable (more stringent) in that it prefers vegetative and bioengineering methods over structural methods, and requires input from a qualified fisheries biologist when structural methods are chosen.<br>**BMP E2.90 - Structural Stream Bank Stabilization**, lists the same measures as EPA BMP - *except* asphalt. Also lists design development principles.<br>**E2.80: Vegetative Stabilization; E2.85: Bioengineering -** Both of these Seattle BMPs are preferred methods of stabilization over structural, if feasible and effective. |

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| **Soil Retaining Measures** | ▲ | Once again, vegetative or bioengineered methods are preferred over structural stabilization in the Seattle code. **BMP E2.45: Bioengineered Protection of Very Steep Slopes** includes Timber Frame Stabilization and other methods for steep slope soil retention. |
| **Dust Control** | ▲ | **BMP E2.20 Dust Control** (p. 46)<br>Encourages minimizing the period of soil exposure, through temporary ground covers and mulches. Silent on spray-on adhesives and calcium chloride. Water or "approved dust palliative" are listed.<br>Construction road and entrance stabilization are covered in<br>**BMP E2.10** (Stabilized Construction Entrance and Tire Wash) and<br>**BMP E2.15** (Construction Road Stabilization)<br>Seattle code more stringent by requiring construction road and entrance stabilization and more specific design criteria. Also does not excludes some of the more environmentally suspect forms of dust control included in the EPA BMPs (e.g., asphalt or latex emulsions, and calcium chloride). |
| **Structural Erosion and Sediment Control Practices** | | |
| **Earth Dike** | ? | Seattle code does not list the Earth Dike as a BMP for construction stormwater control. Permit applicants will have to discuss use of this technique with Seattle code officials to determine if it meets the intent of Seattle stormwater code on a case-by-case basis. |
| **Drainage Swale** | ? | Seattle code does not list the Drainage Swale as a BMP for construction stormwater control. Permit applicants will have to discuss use of this technique with Seattle code officials to determine if it meets the intent of Seattle stormwater code on a case-by-case basis. |
| **Interceptor Dikes and Swales** | ▲ | **BMP E2.55 Interceptor Dike and Swale**<br>Seattle code more specific: design criteria for Interceptor Dikes (p. 62) and swales (p. 20). |
| **Temporary Stream Crossing** | ▲ | **Seattle Municipal Code: Environmentally Critical Areas Ordinance**<br>Seattle code more stringent: *highly unlikely* that a temporary stream crossing would be allowed in Seattle – property around a stream would fall under Seattle's Environmentally Critical Areas ordinance, which prohibits development in environmentally sensitive areas. Developer would be required to find alternate paths for developing site that maintains integrity of environmentally critical areas. |
| **Temporary Storm Drain Diversion** | ▲ | This is not listed as a BMP in the Seattle code, and is not encouraged. Projects requiring storm drain diversion would likely not be permitted and would be reviewed on a case-by-case basis. |
| **Pipe Slope Drains** | ▲ | **BMP E2.25 Pipe Slope Drains**<br>Seattle code more specific: design criteria to handle a 10 year, 24 hour peak flow. Seattle lists a 10-acre maximum drainage area per pipe. |
| **Subsurface Drains** | ▲▼ | **BMP E2.30 Subsurface Drains**<br>Seattle code is of equivalent stringency; Seattle BMP contains design criteria and construction specifications contain additional detail beyond the EPA BMP (see p. 49-51). |
| **Silt Fence** | ▲ | **BMP E3.10: Filter Fence**<br>Seattle code more stringent: restricts this BMP to drainage areas of 1 acre or less, and flow rates of less than 0.5CFS sheet overland flow, and additional design criteria apply. Notes are required on filter fence drawings (p. 81). |
| **Gravel or Stone Filter Berm** | ▲ | **BMP E3.25: Gravel Filter Berm**<br>Seattle code more specific: has additional design criteria for berm material, spacing, and dimensions. |

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| **Storm Drain Inlet Protection** | ▲ | **E3.30 Storm Drain Inlet Protection**<br>The Seattle code is more specific as to the application of different strategies within this BMP (e.g., area sizes, slopes, and stormwater flow rates accompany the different practices). It does not outline sod filters as an option. It encourages "innovative techniques" for accomplishing inlet protection, after such plans receive approval by the Plan Approving Authority. It emphasizes the stabilization of site as the best way of preventing sediment from entering the stormwater system. "Design Criteria" (see p. 93) section provides specific installation criteria for filter fabric fence, concrete block and gravel filter, and gravel and wire mesh filter strategies. |
| **Sediment Trap** | ▲ | **E3.35 Sediment Trap**<br>Seattle code more stringent and more specific: applies to drainage areas of less than **3** acres. Requires sediment disposal details on plans. Requires installation prior to any land disturbance. Specific design criteria details: spillway, 1.5' sump for sediment storage, size of sediment trap, monitoring requirements. |
| **Temporary Sediment Basin** | ▲▼ | **E3.40 Temporary Sediment Pond (or Basin)**<br>Seattle has an upper limit rather than listing a lower limit drainage area. Seattle: where tributary drainage is less than 10 acres. Seattle's settling zone volume is designed using a formula (see p. 103). |
| **Outlet Protection** | ▲▼ | **E2.70: Outlet Protection**<br>Seattle code requires design considerations as outlined in the Director's Rule for Detention Requirements (in the Flow Control Technical Requirements Manual, DR 26-2000). |
| **Check Dams** | ▲▼ | **E2.60 Check Dams**<br>Equivalent stringency; Seattle code is more specific - design criteria for size of logs, depth of embedding, etc. Seattle requires a 1' sump space and does not allow dumping of rock for dam placement - only hand or mechanical placement. Seattle requires removal of dam within 30 days after final site stabilization. Requires removal or stabilization on site of trapped sediment. |
| **Surface Roughening** | ▲▼ | **BMP E2.35: Surface Roughening**<br>In Seattle, required for all surfaces steeper than 3:1 and greater than 5 vertical feet.<br>Seattle recommends stair-stepping for slopes steeper than 2:1.<br>Seattle says grooves should be 12-15" wide and 3" deep.<br>Tracking is cited as preferable to no roughening, but not as effective as other forms due to soil surface compaction.<br>Seattle is silent on the compaction of fill slopes.<br>Seattle is silent on roughening with tracked machinery on clay soils.<br>Dust control protocol covered in BMP E2.20 – Dust Control. |
| **Gradient Terraces** | ▲▼ | **BMP E2.40 Gradient Terraces**<br>In Seattle code, design criteria for maximum spacing based on an algorithm; stringency and specificity otherwise equivalent. |